

CLAIMS

I claim:

1. A solder material, comprising:
a solder component, and
5 a coating composition coupled to the solder component, wherein the coating composition comprises at least one monomer, non-fluorinated polymer or a combination thereof, wherein the polymers comprise at least one of the following: an oxygen atom, a halogen atom, a nitrogen atom, a phosphorus atom, an aromatic ring, a transition metal, a cage compound, a hydridosiloxane group or a combination
10 thereof or at least one monomer that comprise at least one of the following: an alcohol group, a ketone group, an ester group, an ether group, an aldehyde group, a halogen atom, a nitrogen atom, a phosphorus atom, a fused aromatic ring, a cage compound, a transition metal, a hydridosiloxane group or a combination thereof.
2. The solder material of claim 1, wherein the solder component comprises at least one
15 solder sphere, at least one solder ball, solder powder, at least one solder preform or a combination thereof.
3. The solder material of claim 2, wherein the solder component comprises at least one solder ball.
4. The solder material of claim 1, wherein the solder component comprises at least one
20 metal.
5. The solder material of claim 4, wherein the at least one metal comprises lead.
6. The solder material of claim 1, wherein the coating composition comprises at least one-non-fluorinated polymer.
7. The solder material of claim 6, wherein the non-fluorinated polymer is an organic
25 polymer.

8. The solder material of claim 1, wherein the solder component comprises a melting temperature, the coating composition comprises a thermal degradation temperature, and wherein the thermal degradation temperature is less than the melting temperature.
9. An electronic component comprising the solder material of claim 1.
- 5 10. The solder material of claim 1, further comprising an adhesion promoter.
11. A method of forming solder materials, comprising:
 - providing a solder component;
 - providing a coating precursor material;
 - providing a solvent;
 - 10 blending the coating precursor material and the solvent, such that the coating precursor material is substantially solvated to form a coating composition; and
 - applying the coating composition to the solder component, wherein the coating composition comprises at least one monomer, non-fluorinated polymer or a combination thereof, wherein the polymers comprise at least one of the following:
 - 15 an oxygen atom, a halogen atom, a nitrogen atom, a phosphorus atom, an aromatic ring, a transition metal, a cage compound, a hydridosiloxane group or a combination thereof and monomers that comprise at least one of the following: an alcohol group, a ketone group, an ester group, an ether group, an aldehyde group, a halogen atom, a nitrogen atom, a phosphorus atom, a fused aromatic ring, a cage
 - 20 compound, a transition metal, a hydridosiloxane group or a combination thereof.
12. The method of claim 11, further comprising drying or curing the coating composition.
13. The method of claim 11, further comprising drying and curing the coating composition.
14. The method of one of claims 12 or 13, wherein drying the coating composition comprises applying thermal energy to the composition.

15. The method of one of claims 12 or 13, wherein curing the coating composition comprises applying thermal energy to the composition.
16. The method of claim 11, wherein the solder component comprises at least one solder sphere, at least one solder ball, solder powder, at least one solder preform or a combination thereof.
17. The method of claim 16, wherein the solder component comprises at least one solder ball.
18. The method of claim 11, wherein the solder component comprises at least one metal.
19. The method of claim 18, wherein the at least one metal comprises lead.
20. The method of claim 12, wherein the coating composition comprises at least one non-fluorinated polymer.
21. The method of claim 20 wherein the polymer is an organic polymer.
22. The method of claim 11, wherein the solder component comprises a melting temperature, the coating composition comprises a thermal degradation temperature, and wherein the thermal degradation temperature is less than the melting temperature.
23. An electronic component comprising the solder material formed by claim 11.
24. The method of claim 11, further comprising providing an adhesion promoter and blending the adhesion promoter into the coating composition before application to the solder component.
25. A solder material, comprising:
 - a solder component,
 - a coating composition, and
 - an adhesion promoter, wherein the coating composition is coupled to the solder component at least in part by the adhesion promoter.

26. The solder material of claim 25, wherein the solder component comprises at least one solder sphere, at least one solder ball, solder powder, at least one solder preform or a combination thereof.
- 5 27. The solder material of claim 26, wherein the solder component comprises at least one solder ball.
28. The solder material of claim 25, wherein the solder component comprises at least one metal.
29. The solder material of claim 28, wherein the at least one metal comprises lead.
- 10 30. The solder material of claim 25, wherein the coating composition comprises at least one organic polymer.
31. The solder material of claim 30, wherein the organic polymer comprises polyethylene.
32. The solder material of claim 25, wherein the solder component comprises a melting temperature, the coating composition comprises a thermal degradation temperature, and wherein the thermal degradation temperature is less than the melting temperature.
- 15 33. An electronic component comprising the solder material of claim 25.
34. A method of forming solder materials, comprising:
- providing a solder component;
- providing a coating precursor material;
- providing a solvent;
- 20 providing an adhesion promoter;
- blending the coating precursor material and the solvent, such that the coating precursor material is substantially solvated to form a coating composition;
- applying the adhesion promoter to the solder component; and
- applying the coating composition to the solder component.

35. The method of claim 34, further comprising drying or curing the coating composition.
36. The method of claim 34, further comprising drying and curing the coating composition.
37. The method of one of claims 35 or 36, wherein drying the coating composition comprises applying thermal energy to the composition.
- 5 38. The method of one of claims 35 or 36, wherein curing the coating composition comprises applying thermal energy to the composition.
39. The method of claim 34, wherein the solder component comprises at least one solder sphere, at least one solder ball, solder powder, at least one solder preform or a combination thereof.
- 10 40. The method of claim 39, wherein the solder component comprises at least one solder ball.
41. The method of claim 34, wherein the solder component comprises at least one metal.
42. The method of claim 41, wherein the at least one metal comprises lead.
43. The method of claim 34, wherein the coating composition comprises at least one organic polymer.
- 15 44. The method of claim 43, wherein the organic polymer comprises polyethylene.
45. The method of claim 34, wherein the solder component comprises a melting temperature, the coating composition comprises a thermal degradation temperature, and wherein the thermal degradation temperature is less than the melting temperature.
46. An electronic component comprising the solder material formed by claim 34.
- 20 47. A method of forming solder materials, comprising:
providing a solder component,
providing a coating precursor material,
providing a solvent,

providing an adhesion promoter compound;

blending the coating precursor material and the solvent, such that the coating precursor material is substantially solvated,

blending the adhesion promoter into the coating precursor material and solvent to form a coating composition and

applying or coupling the coating composition to the solder component.

48. The method of claim 47, further comprising drying or curing the coating composition.

49. The method of claim 47, further comprising drying and curing the coating composition.

50. The method of one of claims 48 or 49, wherein drying the coating composition comprises applying thermal energy to the composition.

51. The method of one of claims 48 or 49, wherein curing the coating composition comprises applying thermal energy to the composition.

52. The method of claim 47, wherein the solder component comprises at least one solder sphere, at least one solder ball, solder powder, at least one solder preform or a combination thereof.

53. The method of claim 52, wherein the solder component comprises at least one solder ball.

54. The method of claim 47, wherein the solder component comprises at least one metal.

55. The method of claim 54, wherein the at least one metal comprises lead.

56. The method of claim 47, wherein the coating composition comprises at least one organic polymer.

57. The method of claim 56, wherein the organic polymer comprises polyethylene.

58. The method of claim 47, wherein the solder component comprises a melting temperature, the coating composition comprises a thermal degradation temperature, and wherein the thermal degradation temperature is less than the melting temperature.

59. An electronic component comprising the solder material formed by claim 47.